

WHAT IS CLAIMED IS:

1. A broad-band light source comprising:

a semiconductor optical amplifier including an active layer serving as a gain area,
an under-cladding layer and an over-cladding layer formed on the lower and the upper
5 surfaces of the active layer, respectively, and antireflection layers formed at both ends of
the active layer; and

a reflector disposed for reflecting light outputted from the semiconductor optical
amplifier so that the reflected light is inputted back to the active layer so as to minimize a
gain ripple of the semiconductor optical amplifier.

10 2. The broad-band light source as set forth in claim 1, wherein the semiconductor
optical amplifier comprises one of a traveling semiconductor optical amplifier and a
reflective semiconductor optical amplifier.

3. The broad-band light source as set forth in claim 1, further comprising an
optical waveguide for achieving an optical coupling between the semiconductor optical
15 amplifier and the reflector.

4. The broad-band light source as set forth in claim 3, wherein the length of the
optical waveguide is at least double as a coherent length of an amplified spontaneous
emission of the light generated from the semiconductor optical amplifier.

5. The broad-band light source as set forth in claim 4, wherein the length of the optical wavelength is 10 μ m or more.

6. The broad-band light source as set forth in claim 1, wherein the reflector has a reflectivity of 1×10^{-5} or more.

5 7. The broad-band light source as set forth in claim 1, further comprising a polarization controller for controlling a polarization dependence of the semiconductor optical amplifier.

8. A broad-band light source comprising:
10 a semiconductor optical amplifier;
 a reflector for reflecting light outputted from one end of the semiconductor optical amplifier; and
 an optical waveguide for achieving an optical coupling between the semiconductor optical amplifier and the broad-band reflector.

15 9. The broad-band light source as set forth in claim 8, wherein the optical amplifier further comprising an active layer serving as a gain area, an under-cladding and over-cladding layers and formed on the lower and the upper surfaces of the active layer, and antireflection coating layers at both ends of the active layer.

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10. The broad-band light source as set forth in claim 8, wherein the light generated by the semiconductor optical amplifier reaches the reflector via the optical waveguide is reflected back to the active layer of the semiconductor optical amplifier.

5 11. The broad-band light source as set forth in claim 8, wherein the semiconductor optical amplifier comprises one of a traveling semiconductor optical amplifier and a reflective semiconductor optical amplifier.

12. The broad-band light source as set forth in claim 8, wherein the length of the optical waveguide is at least double a coherent length of an amplified spontaneous
10 emission of the light generated from the semiconductor optical amplifier.

13. The broad-band light source as set forth in claim 8, wherein the length of the optical wavelength is 10mm or more.

14. The broad-band light source as set forth in claim 8, wherein the reflector has a reflectivity of 1×10^{-5} or more.

15 15. The broad-band light source as set forth in claim 8, further comprising a polarization controller for controlling a polarization dependence of the semiconductor optical amplifier.